

**Amendment to the Drawings**

The Examiner has objected to the drawings submitted with the application.

Applicant previously corrected the error referring to Figure 10D in the October 10, 2001 Preliminary Amendment.

The incorrect reference to Figs. 6A-6C in the BRIEF DESCRIPTION OF THE DRAWINGS section has been removed and replaced with text making reference to Figure 6, which is set forth on page 17, lines 19-21 of the application. *See* Amendment to the Specification.

The amendment to the specification correcting the typographical error on page 13 (re: neighbor1 41) should eliminate the objection to Figure 3B.

**REMARKS**

In response to the Office Action dated July 26, 2005, Applicant has amended the claims and the specification. Claims 40-50 remain pending in the application. Applicant has also added new claims 51 to 69 in the application. Reconsideration of the rejections and allowance of all claims is respectfully requested.

**The Rejections**

**1. The Examiner has rejected Claims 40-50 as being indefinite because the terms "substantial" and "substantially" allegedly render the claim indefinite.**

The Examiner has rejected Claims 40-50 as being indefinite. Applicant has amended the claim language in Claims 40 and 50 to address the Examiner's comments. Applicant submits that the claims are allowable and requests that the rejection be withdrawn.

**2. Claims 40-50 rejection under 35 U.S.C. 102(e) as being anticipated by Narvaez et al. U.S. Patent No.6,704,320.**

The Examiner has rejected the Claims 40-50 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,704,320 ("Narvaez"). Applicant respectfully disagrees. First, Narvaez is directed to solving a different problem than Applicant's invention. Narvaez describes a network router, a specialized controlling computer. Narvaez proposes an algorithm that runs on a network router to build an optimal routing table for a network. In other words, Narvaez discloses an algorithm for a network router to calculate and build a forwarding table containing the shortest paths for sending data packets between two separate computers (i.e, "nodes" as used in Narvaez) in the router's network.

For example, the first sentence of the Narvaez abstract declares, “[a] dynamic shortest path tree (SPT) algorithm for a router...”. The first sentence of the Narvaez BACKGROUND OF THE INVENTION states, “1. Field of the Invention, The present invention relates to routing of information packets in a communications network, and more particularly, to a router...”. None of the computers in the pairs of computers (or nodes) discussed in Narvaez are involved in running the algorithm. The only computer running the algorithm is the router. In Narvaez, the communications between the computers (or nodes) are directed by the centralized computer, namely the router.

In contrast, Applicant's invention describes an algorithm that runs in a decentralized manner on many computers to organize them for efficient sorting, searching, and broadcasting. All the inter-networked computers described in Applicant's invention are executing the algorithms necessary to sort, search, and broadcast without centralized coordination. As set forth in the abstract, Applicant's invention discloses a technique for organizing a plurality of computers *without the use of a controlling computer*. In stark contrast, Narvaez describes a single controlling computer.

**A. Claim 40**

The Examiner has rejected Claim 40 because Narvaez allegedly teaches a distributed computer network, comprising a collection of computers. Applicant respectfully disagrees. The "distributed computer network" to which Narvaez refers consists of computers that are distributed in the sense that they are not physical neighbors. They are not distributed computers in the sense that they are simultaneously computing the Narvaez algorithm at multiple locations and somehow coordinating the results.

Narvaez does not disclose a distributed processing network, but merely an algorithm to update a router table.

The Examiner has also rejected Claim 40 because Narvaez allegedly discloses means for an added computer to locate the collection of computers. The Examiner cites to col. 11, lines 10-28 of Narvaez on this point ("discloses all connected nodes are determined with associated links"). Applicant respectfully disagrees. In Narvaez, each computer in the network communicates with the router directly regarding its location. See col. 12, lines 47-49. Narvaez does not disclose means for an added computer to locate the collection of computers.

The Examiner has rejected Claim 40 because Narvaez allegedly discloses means for the added computer to establish a connection to the collection of computers. The Examiner cites to col. 11, lines 44-58 of Narvaez as disclosing "links are determined between main node and all other nodes." Applicant respectfully disagrees. The cited portion of Narvaez merely discloses setting "weight" values for a new path between two existing nodes (or computers) in the router's network. This is not a means for the added computer to establish a connection to the collection of computers. Narvaez is directed to establishing a path from one computer to another single computer. In contrast, Applicant's invention is directed to establishing a virtual, dynamic hierarchical relationship from one computer to many computers in a network.

The Examiner has rejected Claim 40 because Narvaez allegedly discloses means for each computer in the collection of computers, including the added computer, to establish a logical arrangement such that each computer in the collection of computers

can act as a top level of a hierarchy, wherein the hierarchy includes at least a substantial number of the computers in the collection of computers. The Examiner cites to col. 10, lines 37-62 of Narvaez as disclosing updated tree adds new nodes and deletes nodes according to distance calculation from the main node. Applicant respectfully disagrees. Narvaez does not describe a system or network where a computer is added or deleted. Narvaez describes recalculation of optimized paths from one node to another. Moreover, there is no node in Narvaez acting as the top level of a hierarchy. Indeed, Narvaez does not even use the word "hierarchy" in the entire patent. Narvaez merely discusses an algorithm operating on a single centralized computer, i.e., the router. In contrast, the hierarchies in Applicant's invention consist of relationships between actual, physically distributed computers.

For the same reasons, rejected Claims 41-50 are allowable as being dependent upon Claim 1, which is not anticipated by Narvaez.

**B. Claim 41**

The Examiner has rejected Claim 41 because Narvaez allegedly discloses the distributed computer network of claim 40, wherein the hierarchy comprises a set of member computers, a membership of which depends upon a logical location of the computer that acts as the top level of the hierarchy. The Examiner cites to col. 11, lines 10-60 of Narvaez on this point. Applicant respectfully disagrees. In addition to the foregoing reasons why Narvaez does not disclose the elements of Claim 40, Narvaez is not creating or establishing any hierarchy in the network. Narvaez is merely using an algorithm to sort calculated paths between nodes to find a "shortest path" from one node

to another. Applicant's invention, in contrast, establishes a virtual, dynamic hierarchical relationship from one computer to many computers in a network, where the "top" of a hierarchy may be a computer that initiates a distribution of a message to the collection or initiates a search query to the collection of computers. Narvaez does not disclose this either.

**C. Claim 42**

The Examiner has rejected Claim 42 because Narvaez allegedly discloses the distributed computer network of claim 40, further comprising means for the computer that acts as the top level of the hierarchy to initiate a search for one of a specified computer and specified data. The Examiner cites to col. 12, lines 16-35 of Narvaez on this point. Applicant respectfully disagrees. Narvaez discloses inspecting "edges" or data parameters in his table of nodes to calculate a distance attribute or "weight" for a path between two nodes. Narvaez does not disclose searching of computers. The searches to which Narvaez refers are searches of tables located on a single centralized computer, i.e., the router. Narvaez is "searching" mathematical parameters in an array of data characterizing the nodes in his network. Applicant's invention, on the other hand, searches physically distributed computers for specific information. Narvaez does not. In addition to the reasons why Narvaez does not disclose the elements of Claim 40, Narvaez does not disclose the elements of Claim 42.

**D. Claim 43**

The Examiner has rejected Claim 42 because Narvaez allegedly discloses the

distributed computer network of claim 42, wherein each computer in the collection of computers includes a searchable index of the contents of the computer for facilitating said search. The Examiner cites to col. 12, lines 16-35 of Narvaez on this point. Applicant respectfully disagrees. Narvaez discloses inspecting "edges" or data parameters in his table of nodes at the router to calculate a distance attribute for a path between two nodes. Narvaez does not disclose searching of computers. Narvaez is "searching" mathematical parameters in a data array characterizing the nodes in his network. Narvaez does not disclose each computer in the collection including a searchable index of the contents of the computer to facilitate a search.

**E. Claim 44**

The Examiner has rejected Claim 44 because Narvaez allegedly discloses the distributed computer network of claim 40, further comprising means for the computer that acts as the top level of the hierarchy to broadcast information throughout the hierarchy. The Examiner cites to col. 12, lines 16-35 of Narvaez on this point. Applicant respectfully disagrees. Narvaez merely discusses inspecting data parameters in a data array to calculate a distance attribute for a path between two nodes. Narvaez does not discuss or deal with broadcasting information throughout a network of computers. It also does not disclose means for a computer acting as the top level of a hierarchy to broadcast information throughout the hierarchy.

**F. Claim 45**

The Examiner has rejected Claim 45 because Narvaez allegedly discloses the

distributed computer network of claim 40, further comprising means to control a bandwidth utilization of the collection of computers. The Examiner cites to col. 1, lines 15-30 of Narvaez on this point. Applicant respectfully disagrees. Narvaez does not disclose means to control bandwidth utilization of a collection of computers. Narvaez only discloses, in the context of discussing prior art router table algorithms, that bandwidth is merely a factor in the "link cost" or "weight" to be used by a router to determine the "shortest path" between two nodes. This does not disclose controlling bandwidth utilization of a collection of computers.

**G. Claim 46**

The Examiner has rejected Claim 46 because Narvaez allegedly discloses the distributed computer network of claim 40, further comprising a plurality of lower level computers, wherein information regarding the lower level computers is stored in a respective one of the computers in the collection of computers. The Examiner cites to col. 4, lines 10-60 of Narvaez on this point. Applicant respectfully disagrees. For the same reasons Narvaez does not disclose the elements of Claim 40, it does not anticipate Claim 46.

**H. Claim 47**

The Examiner has rejected Claim 47 because Narvaez allegedly discloses the distributed computer network of claim 40, further comprising means for rebuilding a logical arrangement of the collection of computers following a loss of at least one computer from the collection of computers. The Examiner cites to col. 4, lines 10-60 of



Narvaez. Applicant respectfully disagrees. Narvaez discloses calculation of the shortest path from one node to another in a network for a router table. Narvaez recalculates the optimal route between nodes (according to the weighting factors considered by the disclosed algorithm). Narvaez does not teach rebuilding a logical arrangement of the collection of computer following a loss of at least one computer from the collection of computers. Applicant's invention teaches how to rebuild the logical arrangement within the collection of computers, without a centralized controlling computer, following the loss of one or more computers in the collection due to functionality reasons or network problems. This allows, for example, the collection of computers to rebuild its logical arrangement in the context of a failure recovery. Narvaez does not teach this.

**I. Claim 48**

The Examiner has rejected Claim 48 because Narvaez allegedly discloses the distributed computer network of claim 40, further comprising means for distributing software updates throughout the collection of computers. The Examiner again cites to col. 4, lines 10-60 of Narvaez on this point. Applicant respectfully disagrees. For the same reasons as Claim 44, Narvaez does not disclose distributing software updates throughout a collection of computers, much less how to accomplish such a task. Narvaez is only calculating a router table.

**J. Claim 49**

The Examiner has rejected Claim 49 because Narvaez allegedly discloses the distributed computer network of claim 40, wherein each computer in the collection of

computers includes dynamic physical address. The Examiner cites to col. 7, lines 40 – col. 8, lines 60 of Narvaez on this point. Applicant respectfully disagrees. Narvaez discloses an algorithm that is purportedly "dynamic," presumably because he updates the router table. This has nothing to do with and does not disclose a distributed computer network wherein each computer in the collection of computers includes a dynamic physical address. Applicant's invention teaches organizing a collection of computers whose address may change due to dynamic allocation of addresses due to mechanisms such as DHCP (dynamic host configuration protocol) or network address translation techniques.

**K. Claim 50**

The Examiner has rejected Claim 50 because Narvaez allegedly discloses the distributed computer network of claim 40, further comprising means for generating the logical arrangement to substantially minimize a logical distance between a logical center of the collection of computers and a logical collection edge. The Examiner cites to col. 4, lines 10-60 of Narvaez on this point. Applicant respectfully disagrees. Narvaez is optimizing routes from one node to another node in his network. In contrast, Applicant's invention manages the logical arrangement of the computers in the collection of computers to maintain an efficient geometry for a one-to-many broadcast of data or search query.

For the foregoing reasons, Applicant respectfully submits that Narvaez does not anticipate Claims 40-50 and the rejections should be withdrawn.

**Amendment to the Specification:**

Applicant has amended the specification to correct a description of Figure 6 in the BRIEF DESCRIPTION OF THE DRAWINGS section on page 10, line 4 ("Fig 6 illustrates the rapid increase in the number of computers reached with the addition of each concentric polygon."). This amendment corrects a typographical error (removing a description of Figures 6A to 6C) because Figures 6A – 6C do not exist. Only Figure 6 was submitted with the original application. The description of Figure 6 is found on page 17, lines 19-20. Accordingly, the amendment does not add new matter to the application.

Applicant has also amended the specification in the paragraph beginning on page 12, line 21 as follows:

"The logical means to communicate 25 is defined by a neighbor relationship. Each computer possesses links to four neighbors. Fig. 3A illustrates each computer's neighbors as neighbor0 40, neighbor1 41, neighbor2 42, and neighbor3 43. Neighbor1 41 is clockwise from neighbor0 40, neighbor2 42 is clockwise from neighbor1 41, and neighbor3 43 is clockwise from neighbor2 42."

This amendment is to correct two typographical errors. The first is to remove a comma between "neighbor0" and "40" on page 13, line 1. The second typographical error stated that the described neighbor relationship between the computers shown in Figure 3A (*i.e.*, neighbor0 40 to neighbor1 41 to neighbor2 42 to neighbor3 43) were "counterclockwise", when they were actually clockwise – as shown in Figure 3A. In particular, neighbor1 41 is the next computer in a clockwise direction from neighbor0 40,

neighbor2 42 is the next computer in the clockwise direction from neighbor1 41, and so on. *See* Figure 3A. This amendment is to correct typographical errors and does not add any new matter.

Applicant has amended the reference to "neighbor 41" to "neighbor1 41" to correct a typographical error in line 20 of page 13. This amendment does not add any new matter.

**Amendment to the Drawings:**

The Examiner has objected to the drawings submitted with the application.

With regard to a missing Figure 10D, Applicant previously corrected the error referring to Figure 10D in the October 10, 2001 Preliminary Amendment.

In the above Amendment to the Specification, the reference to Figs. 6A-6C in the BRIEF DESCRIPTION OF THE DRAWINGS section has been corrected to make reference to Figure 6, along with a description of the drawign which is set forth on page 17, lines 19-21 of the application. *See* Amendment to the Specification. This amendment is to fix a typographical error. Since, the substituted text referring to Figure 6 is found on lines 19-21 of page 17, Applicant submits that this amendment does not add new matter to this application.

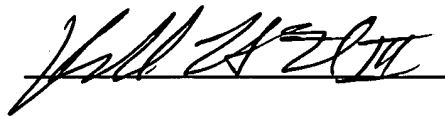
The Examiner objected to Figure 3B because the reference to "neighbor 41" on page 13 of the specification did not exist. The reference to "neighbor 41" is a typographical error and should be "neighbor1 41", which reference is shown in Figure 3A. Applicant submits that this overcomes Examiner's objection to Figure 3B.

Applicant previously submitted a petition for an extension of the time, along with a check for the extension fee, in the above-identified application for three months to respond to the Office Action dated July 26, 2005. The Notice of Noncompliance does not indicate that resubmission of the petition for extension of time is required. Accordingly, Applicant believes that no further extensions of time are required in connection with this paper. In the event this is incorrect, Applicant requests that the Examiner contact Applicant at the earliest opportunity at (972) 702-0817.

For the foregoing reasons, Applicant respectfully submits that the Amendment complies with the necessary formatting requirements and further requests the Examiner to withdraw all of the objections and rejections and allow issuance of the claims.

Respectfully submitted,

Russell H. Fish III

A handwritten signature in black ink, appearing to read 'Russell H. Fish III', written over a horizontal line.

Dated: April 23, 2006

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## APPENDIX

Specification page 10, lines 4-5:

~~"Figs 6A to 6C show the path of a broadcast message originating from the top computer of the heirarchy. Fig 6 illustrates the rapid increase in the number of computers reached with the addition of each concentric polygon."~~

Specification page 12, lines 21- page 13, line 6:

"The logical means to communicate 25 is defined by a neighbor relationship. Each computer possesses links to four neighbors. Fig. 3A illustrates each computer's neighbors as neighbor0[,] 40, neighbor1 41, neighbor2 42, and neighbor3 43. Neighbor1 41 is ~~to the right of (or counterclockwise from[])~~ neighbor0 40, neighbor2 42 is ~~to the right of (or counterclockwise from[])~~ neighbor1 41, and neighbor3 43 is ~~to the right of (or counterclockwise from[])~~ neighbor2 42."

Specification page 13, line 20-22:

"the neighbor1 41 of every computer on a radial 26 point to a line of neighbor2 42 to neighbor0 40 relationships which form indirect radials 27."